

WHAT IS CLAIMED IS:

1           1. A method of changing the permeabilities of  
2   tubular wrappers of rod-shaped products of the tobacco  
3   processing industry, comprising the step of simultane-  
4   ously changing the permeabilities of wrappers of a  
5   plurality of products.

1           2. The method of claim 1, wherein said step  
2 includes perforating the wrappers of  $\underline{n} \geq 2$  products,  
3  $\underline{n}$  being a natural number.

1           3. The method of claim 2, wherein said  
2 perforating step includes establishing a source of  $\underline{n}$  at  
3 least substantially parallel laser beams, and directing  
4 the  $\underline{n}$  beams upon  $\underline{n} - \underline{x}$  oscillatable beam reflecting  
5 mirrors to focus the  $\underline{n}$  beams upon the wrapper of at  
6 least one product,  $\underline{x}$  being a natural number less than  
7  $\underline{n}$ .

1           4. The method of claim 3, wherein  $\underline{n}$  equals two.

1           5. The method of claim 3, further comprising the  
2 step of moving the products in the course of said chang-  
3 ing step and oscillating each mirror to thus focus the  
4 beams upon the wrappers of moving products.

1           6. The method of claim 5, wherein  $\underline{n}$  equals two.

1           7. The method of claim 2, wherein said changing  
2    step includes simultaneously perforating m selected  
3    portions of the wrapper of each product.

1           8. The method of claim 7, wherein m  $\geq$  2 and is  
2    a natural number.

1           9. The method of claim 8, wherein said perforat-  
2    ing step includes directing m substantially parallel  
3    pulsating laser beams upon the wrapper of each product.

1           10. The method of claim 9, wherein said  
2    perforating step includes simultaneously directing p  
3    laser beams upon q partially reflecting mirrors to  
4    reflect a first portion and to permit passage of a  
5    second portion of each laser beam, and directing  
6    the second portions of the laser beams against at least  
7    one fully reflecting mirror, m being equal to p(q + 1)  
8    wherein p is a natural number and q is a natural number  
9    including zero.

1           11. A device for changing the permeabilities of  
2   tubular wrappers of a series of at least substantially  
3   equidistant rod-shaped products, comprising:  
4           means for emitting n laser beams; and  
5           means for simultaneously directing the laser beams  
6   upon the wrappers of n products, n being a natural num-  
7   ber greater than one and said directing means including  
8   n - x movable mirrors arranged to deflect a plurality  
9   of beams making an acute angle the magnitude of which  
10   is a function of the distance between neighboring  
11   products of said series, x being a natural number less  
12   than n.

1           12. The device of claim 11, further comprising  
2 means for moving the products of the series along a  
3 predetermined path and means for oscillating each mirror  
4 to thus focus the beams upon the wrappers of selected  
5 products in said path.

1           13. The device of claim 12, wherein said  
2 directing means includes means for simultaneously fo-  
3 cussing at least one discrete beam upon each of m  
4 different portions of the wrapper of each of the series  
5 of products in said path, m being a natural number ex-  
6 ceeding one.

1           14. The device of claim 13, wherein said oscillat-  
2 ing means includes means for oscillating the n - x  
3 mirrors about a common axis.

1           15. The device of claim 11, wherein said mirrors  
2 include  $g = (\underline{m}/\underline{p}) - 1$  partially transmitting mirrors  
3 arranged to split each of  $p$  incident beams into a reflected  
4 first portion and a transmitted second portion, and at  
5 least one fully reflecting mirror for said second portions  
6 of the beams,  $p$  being a natural number and  $g$  being a  
7 natural number including zero.

1           16. Apparatus for treating smokers' products of  
2     the type wherein a rod-shaped component is surrounded  
3     by a tubular wrapper carrying a deformable strip, com-  
4     prising:

5           a rolling unit having a plurality of surfaces  
6     defining a channel and including at least one first  
7     surface which moves relative to at least one second  
8     surface, said channel having an inlet and an outlet;

9           means for feeding into said inlet successive  
10    products of a series of products having tubular wrappers  
11    each of which is contacted by the respective strip whe-  
12    reby the wrappers are caused to roll due to contact with  
13    said surfaces and to thus convolute the respective strips  
14    thereabout in said channel; and

15          means for changing the permeabilities of the  
16    wrappers during rolling in a predetermined portion of  
17    said channel, comprising means for simultaneously per-  
18    forating the wrappers of at least two products in said  
19    predetermined portion of said channel.

1           17. The apparatus of claim 16, wherein said  
2 channel includes an additional portion which is disposed  
3 at said inlet and the strips are convoluted around the  
4 respective wrappers in said additional portion of said  
5 channel, said predetermined portion of said channel im-  
6 mediately following said additional portion, as seen in  
7 a direction from said inlet toward said outlet, said  
8 perforating means being arranged to change the permea-  
9 bilities of the wrappers of products at least in said  
10 predetermined portion of said channel.

1           18. The apparatus of claim 17, wherein said  
2 perforating means is constructed and arranged to start  
3 the perforating of wrappers in said additional portion  
4 of said channel.

1           19. The apparatus of claim 16, wherein at least  
2 a portion of said channel has an arcuate shape.



1           20. The apparatus of claim 16, wherein said  
2 rolling unit comprises a rotary conveyor having a  
3 cylindrical peripheral surface constituting said at  
4 least one first surface, and a stationary rolling member  
5 having a concave surface concentric with and spaced  
6 apart from said peripheral surface and constituting said  
7 at least one second surface.